Title: Hours Spent Playing Videogames is Associated With Increased Executive Functioning Skills in Children

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Introduction: Executive Functioning (EF) is a set of skills that include various cognitive abilities, such as attention, inhibition, memory, and regulation of mental activity (Zelazo et al., 1997). EF is important for school performance, emotional regulation, and decision-making (Best & Miller, 2010). The Stroop assessment has been used as an effective measure of EF (Homack & Riccio, 2003). Research shows active video game play may have positive effects on EF skills (Buelow et al., 2015). To examine this relationship, in addition to measuring videogame playing and EF, we measured television viewing to rule out the possibility that general screen-time is related to EF.

Method: To examine associations between EF and videogame playing in children, we asked the parents of 34 children aged 7-12 to provide the number of hours a week their child played videogames and watched television. We also administered the Stroop test to children to measure EF (Golden et al., 2003).

Results: Spearman Correlations showed that the more hours a child played videogames, the lower their Stroop Interference score ($\rho = -.368$, $p = .032$), which indicates increased EF. On the other hand, we did not find a significant correlation between hours of playing videogames and hours of television watched, nor between hours of television watched and Stroop.

Conclusion: These analyses suggest that while more videogame playing may lead to increased EF, watching television does not have this same benefit. This suggests that general screen-time does not lead to better EF, but that the cognitive control, attention, and/or visual-spatial skills

involved in playing videogames is what is important. However, these findings are correlational, so it is just as possible that children who have better EF skills tend to play more videogames. To our knowledge, this is the first instance of looking at associations between videogame playing and EF that has been done naturalistically, rather than experimentally, as well as the first time that EF's relationship to two different forms of screen time has been contrasted. Future directions include examining what specific types of videogames are being played, and whether certain types of games have greater impact on EF.

Keywords: Video games, Executive Function, Stroop assessment